JAPANESE [JP,2002-038159,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

* NOTICES *

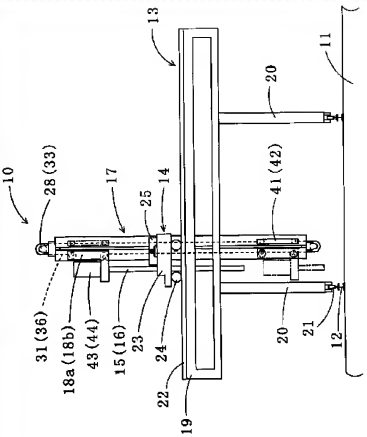
JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the observation repairing device of the coke oven combustion chamber which performs observation, repair, etc. of the damaged part of the wall of the combustion chamber of a coke oven.
[0002]
[Description of the Prior Art]Conventionally, the coke oven comprises a refractory brick.
By arranging a combustion chamber on both sides of a coke oven chamber, and carrying out heat transfer of the heat of a combustion chamber to a coke oven chamber indirectly through a wall, coal in a coke oven chamber is carbonized and corks are manufactured.
Since this coke oven has many furnaces which will pass 30 to 40 years and it is moreover used on the large conditions of a temperature change, The crack which flowed in the masonry joint piece and coke oven chamber of the refractory brick which constitutes a combustion chamber occurs, and generating of the black smoke by the leak of the

Drawing selection Representative draw



[Translation done.]

carbonization gas from a coke oven chamber to a combustion chamber, etc. or the loss of coke oven generated gas, oxidation of coal by invasion of the combustion gas from a combustion chamber to a coke oven chamber, etc. arise. And if the masonry joint piece and crack of a refractory brick are neglected, the deficit and omission of a refractory brick advance in connection with heat load, it deteriorates rapidly and there is a problem of the life of a coke oven falling substantially. As this measure, as indicated to JP,7-45666,B, On the rail formed in the corks furnace crown wall upper surface (upper part), the movable cart it can run freely to the direction which intersects perpendicularly with the longitudinal direction of a coke oven chamber is formed, The boarding ramp vehicle and guiding ascent and descent it runs to the longitudinal direction of a coke oven chamber are provided in this movable cart, Going up and down and picturizing the water-cooled lance which built in the television camera via the guiding ascent and descent to a combustion chamber, going up and down the water-cooled lance for repair with which another movable cart which runs the upper part of said coke oven in a similar manner was equipped based on this picture, and performing a plasma metal spray to a repair part from the inside of a coke oven chamber is performed. Inserting the water-cooled lance which built the viewing device in a furnace and the spray device of refractories in the combustion chamber of the coke oven, spraying it on the observed damaged part, and carrying out a plasma metal spray using the nozzle of a device is performed as indicated to JP,7-45667,B. As indicated to JP,59-136381,A, JP,3-105195,A, and JP,7-126636,A, Observation and repair of the wall of a coke oven chamber are performed using a slide arm or a traveling base car provided with a viewing device or a viewing device, and repairing devices, such as a plasma metal spray, etc.

[0003]

[Problem(s) to be Solved by the Invention]However, in the method indicated to JP,7-45666,B and JP,7-45667,B. The stroke of the water-cooled lance provided with the television camera or plasma metal spray nozzle which the depth (height) of the combustion chamber of the usual coke oven is 4-5m, and goes up and down via the guiding ascent and descent provided in the movable cart also requires 4-5m at worst, The height of the device in consideration of the composition of members, such as a guiding ascent and descent, is set to 6-7m. It is difficult to establish the storage facility of coal for the larry cars of coal in the upper part of the coke oven, for the passage allowable height of this lower part to be as low as 5 m or less, to become an obstacle at the time of the device which consists of a guiding ascent and

descent or a water-cooled lance passing on the other hand, and to perform observation and repair of a combustion chamber of the whole direction of a length of chamber. And the temperature atmosphere on a coke oven is under the harsh environment sharply changed at 0-50 **, From inserting in the combustion chamber of the depth (4-5m) etc., the water-cooled lance provided with the television camera or the plasma metal spray nozzle. It is easy to produce the error accompanying thermal expansion, such as a guiding ascent and descent, and there is a problem of the accuracy of being unable to make a plasma metal spray nozzle counter correctly the damaged part observed with the television camera etc. In the method indicated to JP,7-45666, B, JP,59-136381,A, JP,3-105195,A, JP,7-126636,A, etc. In order to repair from the inside of a coke oven chamber, the unevenness accompanying plasma metal spray repair occurs in a coke oven chamber, and there are problems, such as causing an increase and poor extrusion of extrusion resistance of corks when this unevenness is going too far, after dry-distilling, etc. Thus, in the device which carries out observation and repair of the conventional combustion chamber. The obstacle of the coke oven could not be avoided, a stroke could not be expanded, and observation of the whole combustion chamber and repair could not be performed, but moreover, it is difficult to carry out alignment of the plasma metal spray nozzle location of the television camera position of a viewing device, or a repairing device correctly, and there was a problem which is hard to put in practical use.

[0004]This invention was made in view of this situation, avoids the obstacle on a coke oven, and performs observation and repair of the whole combustion chamber of a coke oven, And it aims at providing the observation repairing device of the coke oven combustion chamber which can expand the stroke of a lance and can perform observation and repair of the depth direction of a combustion chamber of all the walls with sufficient accuracy.

[0005]

[Means for Solving the Problem]An observation repairing device of a coke oven combustion chamber concerning this invention in alignment with said purpose, When a transverse carriage is laid in a traveling base car which runs a rail installed on a furnace of a coke oven, a boarding ramp vehicle holding a lance which goes up and down inside of a guiding ascent and descent and a guiding ascent and descent is established in a transverse carriage and a boarding ramp vehicle goes up and down, It has connected with an endless track which attached a boarding ramp vehicle to a guiding ascent and descent in a device which goes up and down a

lance and performs observation and repair of a combustion chamber of a coke oven. By this, height of the whole device, such as a guiding ascent and descent, can be made low, a stroke of a lance can be made into the maximum, an obstacle of a coke oven can be avoided, and the whole combustion chamber sequence arranged at a longitudinal direction of a coke oven can be observed and repaired. And observation and repair of the lower part of all the walls can be performed from the upper part of a combustion chamber, and extension of a life of a coke oven can be aimed at.

[0006]In an observation repairing device of a coke oven combustion chamber concerning this invention, a rack may be formed in a guiding ascent and descent, and a measurable measuring instrument may be formed for rise-and-fall distance of a lance in a boarding ramp vehicle via a sprocket geared and rolled on a rack. When elasticity of a temperature atmosphere on a coke oven, a machining error, etc. arises in a guiding ascent and descent, a tip position of a lance can be determined according to the amount of elasticity.

[0007]An encoder which contained a limit switch may be used for a measuring instrument in an observation repairing device of a coke oven combustion chamber concerning this invention. Since migration length of a boarding ramp car connected with an endless track is doubled with migration length of a rack which made an operation start of a limit switch a reference point using a simple means by an encoder which contained a limit switch, a tip position of a lance can be grasped correctly.

[0008]In an observation repairing device of a coke oven combustion chamber concerning this invention, although each wheel of the upper part used as a pair provided in a boarding ramp vehicle and the bottom is set to the state where it was pressed with an eccentric shaft in the direction which is different into a slot of a frame of a guiding ascent and descent, it is preferred. Since a wheel of up-and-down ****** fitted in in a frame of a guiding ascent and descent is pressed in the direction different, respectively, inclination of a lance by lance prudence at the time of a boarding ramp vehicle going up and down, an error of machining, etc. can be controlled.

[0009]

[Embodiment of the Invention]Then, referring to the attached drawing, it explains per [which materialized this invention] embodiment, and an understanding of this invention is presented. The front view of the ascending and descending means of the water-cooled lance and drawing 3 of the general drawing of the observation repairing device of the coke oven combustion chamber which requires drawing 1 for the 1 embodiment of this invention, and drawing 2 are

the sectional views of the wheel part of a boarding ramp vehicle. As shown in drawing 1 and drawing 2, the observation repairing device 10 of the coke oven combustion chamber concerning the 1 embodiment of this invention is provided with the following.
The traveling base car 13 which can run the rail 12 top constructed on the furnace of the longitudinal direction of the coke oven 11 freely.
The transverse carriage 14 which runs the traveling base vehicle 13 top crosswise [of the coke oven 11].
The guiding ascent and descent 17 attached to the transverse carriage 14.
The boarding ramp cars 18a and 18b which hold the water-cooled lances 15 and 16 which are examples of a lance about the inside of this guiding ascent and descent 17, and it goes up and down.
The ascending and descending means of a water-cooled lance has the guiding ascent and descent 17 and the boarding ramp vehicles 18a and 18b.
[0010]The traveling base vehicle 13 has the stand 19 made of steel supported with the four supports 20, and the wheel 21 is attached to the end face of each strut 20, and it is running the rail 12 top to the longitudinal direction of the coke oven 11 with drives, such as an electric motor which is not illustrated. On the stand 19 of the traveling base vehicle 13, the rail 22 for transverse carriage 14 is constructed to the furnace width direction of the coke oven 11. The transverse carriage 14 has the stand 23 made of steel, and it has the wheel 24 rolling on the rail 22 top provided in the stand 19 of the traveling base vehicle 13 under this stand 23. In support of the guiding ascent and descent 17, the tilting stand 25 tiltable free is laid in this stand 23 by the oil hydraulic cylinder etc. which are not illustrated.
[0011]By the guiding ascent and descent's 17 being a product made of steel, for example, making U form or the channel of H form counter at the predetermined intervals, and arranging and connecting it, It has 2 sets of frames 26a and 26b in which the slot which is not illustrated inside was formed, and is constituted, and the frames 26a and 26b are being fixed by the connecting part 26c in one. The wheels 27a and 27c and the wheels 27b and 27d which were provided in the up-and-down couple at the both sides of the boarding ramp vehicle 18a are fitted in Mizouchi who countered the frame 26a and was formed. The boarding ramp car 18a which supported pivotally these wheels 27a and 27c and wheels 27b and 27d, It is being fixed to the endless track formed with the chain 31 which is an example of a rack which geared to the sprocket 29 connected with the electric motor 28, and the sprocket 30 provided in the lower end of the frame 26a, The water-cooled lance 15 for repair

provided with the nozzle for thermal spraying at the tip is attached to the boarding ramp vehicle 18a.

[0012]The wheels 32a and 32c and the wheels 32b and 32d which were provided in the up-and-down couple at the both sides of the boarding ramp vehicle 18b are fitted in Mizouchi who countered the frame 26b and was formed. The boarding ramp vehicle 18b is being fixed to the endless track formed with the chain 36 which is an example of a rack which geared to the sprocket 34 connected with the electric motor 33, and the sprocket 35 provided in the lower end of the frame 26b, The water-cooled lance 16 for observation provided with an inspection hole, a camera, etc. at the tip which is an example of a lance is attached to the boarding ramp vehicle 18b. The encoders 38a and 38b which are examples of the measuring instrument of the rise-and-fall distance which connected the sprockets 37a and 37b with each and which contained the limit switch generally used are attached to the boarding ramp vehicle 18a and the boarding ramp vehicle 18b.

[0013]The upper bed and the lower end were fixed to each frames 26a and 26b of the guiding ascent and descent 17, and the standard chains 39 and 40 which are examples of the rack changed into the abbreviated tension state are provided in the sliding direction of the guiding ascent and descent 17 so that it may gear with the gear tooth of these sprockets 37a and 37b. And the sprockets 37a and 37b suit the standard chains 39 and 40 at **, and he is trying to roll by rise and fall of the boarding ramp vehicles 18a and 18b. The limit switch for detection of the minimum which the encoders 38a and 38b (the water-cooled lance 15, for 16) do not illustrate is formed in the lower end of the standard chains 39 and 40, respectively.

[0014]In order to reduce the rise-and-fall load of the water-cooled lances 15 and 16 to the chains 31 and 36 connected with the boarding ramp vehicle 18a and the boarding ramp vehicle 18b, the counter balance weight 41 and 42 is attached to the chains 31 and 36 of an endless track. As shown in drawing 1, when the boarding ramp vehicle 18a and the boarding ramp vehicle 18b are located in an upper limit position, the fitting location of this counter balance weight 41 and 42 is attached so that it may come to a lower limit position. On the lance heads 43 and 44 provided in the upper bed part of the water-cooled lances 15 and 16. Have established the turning means which circles in the water-cooled lances 15 and 16 and which is not illustrated, and on the lance head 43. Supply system ways, such as cooling water, a thermal spraying material, and gas, have provided coupling etc. in the lance head 44 so that cooling water, a signal cable, and the supply system way of the gas for a purge can connect, respectively.

[0015]Next, operation of the observation repairing device 10 of the coke oven combustion chamber concerning the 1 embodiment of this invention is explained. It is made to run the traveling base vehicle 13 on the rail 12 constructed on the furnace of the longitudinal direction of the coke oven 11, and the center of the traveling base vehicle 13 is doubled with the position which observes the flue hole line (they are usually 20-30 pieces to a single tier) which was provided at the furnace width direction, and which is not illustrated, and the traveling base vehicle 13 is stopped. Then, alignment of the water-cooled lance 16 for observation is carried out to the flue hole which observes by moving the transverse carriage 14 to the furnace width direction of the coke oven 11. If the position of the water-cooled lance 16 is determined to a flue hole, by the drive of the electric motor 33, the sprocket 34 will be rotated, and the chain 36 of the endless track connected with the boarding ramp vehicle 18b will be rolled and taken down.

[0016]While the wheels 32a-32d fitted in the slot of the frame 26b of the guiding ascent and descent 17 by rolling and taking down the chain 36 of an endless track rotate, the boarding ramp vehicle 18b descends along the slot of the frame 26b. Simultaneously, it is fixed to the boarding ramp vehicle 18b, and descends in the flue hole which does not illustrate the water-cooled lance 16 with a diameter of 100-120 mm and a length of 4-m [5] for observation, either. Simultaneously with the downward start of this water-cooled lance 16, the limit switch of the encoder 38b and the operation of the sprocket 37b are started, This time is made into the reference point in the encoder 38b, and the distance which descended is measured from the number of rotations of the sprocket 37b geared and rolled to the standard chain 40 provided with the same elasticity as the guiding ascent and descent 17.

[0017]By doubling the stop position of descent of the boarding ramp vehicle 18b with the descent distance measured by this encoder 38b, The error of the rise-and-fall distance generated to the chain 36 of an endless track by elasticity by a large atmosphere of change on the coke oven 11 can be amended, and the measuring point of the flue wall (combustion chamber wall) by the water-cooled lance 16 for observation can be determined with sufficient accuracy. This observation can observe the flue wall of the range of 360 degrees of circumferences by making it circle in the lance head 44, and changing direction of the water-cooled lance 16 into right and left in 0-180 degrees, respectively.

[0018]And in order to go up and down the boarding ramp car 18b which connected the water-cooled lance 16 using the chain 36 of an endless track, The height of the frame 26b of the guiding ascent and descent 17 and the whole electric

motor 33 grade laid on the guiding ascent and descent 17 can be made low, and height restrictions of the stock-of-coal device for larry cars of the coke oven 11, etc. can be avoided. And the maximum stroke of the water-cooled lance 16 can be secured, and a masonry joint piece, a lacking part, etc. of the whole flue wall can be observed.

[0019]In order the diameter of a flue hole is as small as 100-120 mm and to insert the water-cooled lance 16 in this flue hole, By the gap of the frame 26b of the guiding ascent and descent 17, and the wheels 32a, 32b, 32c, and 32d of the boarding ramp vehicle 18b, or the error on machining from which it does not finish suffering, the water-cooled lance 16 inclines and the position at a tip shifts greatly. The wheel 32a of the boarding ramp car 18b upper part fitted in the slot of the frame 26b as shown in drawing 3 in order to prevent this inclination, The inclination at the time of rise and fall of the water-cooled lance 16 can be lost by adjusting the position of the water-cooled lance 16 so that an eccentric shaft may be used for the wheels 32c and 32d of 32b and the bottom, it may change into the state where it was pressed in the direction from which each differs and the water-cooled lance 16 may become vertical at this time. As a result, the water-cooled lance 16 can be easily inserted in the inside of a flue hole with a small diameter.

[0020]And the masonry joint piece by which it was generated in the wall of the combustion chamber, the state of a crack, and its occurrence position are correctly displayed on displays for indication, such as a monitor, by the water-cooled lance 16. If the water-cooled lance 16 descends and it becomes near the pars basilaris ossis occipitalis of a combustion chamber, the limit switch formed in the lower part of the standard chain 40 will operate, and motion moving will stop. The water-cooled lance 16 which ended observation drives the electric motor 33, and by rotation of the sprocket 34, the chain 36 can wind up, the boarding ramp vehicle 18b and the water-cooled lance 16 go up, and it stands by out of the system of a flue hole. When observing by moving the traveling base vehicle 13, the guiding ascent and descent 17 of the water-cooled lance 16 and the water-cooled lance 15 can be made to be able to tilt by operation of the tilting stand 25, and the obstacle on the furnace of the coke oven 11 can be avoided easily.

[0021]Next, when repairing, it is made to run the transverse carriage 14 on which the water-cooled lance 15 for repair was put, and moves to a right above [a flue hole] position. And the chain 31 connected with the boarding ramp vehicle 18a is rolled by rotation of the sprocket 29, is taken down, and the boarding ramp vehicle 18a is dropped. The water-cooled lance 15 for repair attached to the boarding ramp

vehicle 18a also descends simultaneously, and is inserted into a flue by descent of this boarding ramp vehicle 18a. The water-cooled lance 15 is pressing the upper wheels 27a and 27b and the lower wheels 27c and 27d which were fitted in the slot of the frame 26a of the guiding ascent and descent 17 in the direction from which the upper and lower sides differ into the slot of the frame 26a, Inclination of the water-cooled lance 15 by prudence of the water-cooled lance 15, machining, etc. can be lost, and it can insert easily into a flue hole 100-120 mm in diameter.

[0022]And the reference point (limit switch operation start point) by the encoder 38a and the descent distance from it are measured like the water-cooled lance 16 using the standard chain 39 provided with the same elasticity as the guiding ascent and descent 17. The position at the tip of the water-cooled lance 15 for repair can be determined with sufficient accuracy by doubling the stop position of the boarding ramp vehicle 18a with the descent distance measured by this encoder 38a. And it descends to the position of the masonry joint piece observed by the water-cooled lance 16 mentioned above or a lacking part, and stops, and the water-cooled lance 15 inserted into the flue sprays a fire refractory material from the thermal spraying nozzle which was provided at the tip and which is not illustrated, and performs blockade of a masonry joint piece, and restoration of a lacking part.

[0023]By circling in the lance head 43, this repair can change direction of the water-cooled lance 15 in the range of 0-180 degrees of each right and left, and can repair the masonry joint piece and lacking part which were generated in the surrounding flue wall. The water-cooled lance 15 which ended thermal spraying drives the electric motor 28, and by rotation of the sprocket 29, the chain 31 can wind up, the boarding ramp vehicle 18a and the water-cooled lance 15 go up, and it stands by out of the system of a flue hole.

[0024]Thus, observation of the flue wall by the water-cooled lance 16 for observation connected with the boarding ramp vehicle 18b and thermal-spraying repair of a masonry joint piece or a lacking part by the water-cooled lance 15 for repair connected with the boarding ramp vehicle 18a are performed repeatedly. And since the guiding ascent and descent 17 is made low and the elevating length of the water-cooled lances 15 and 16 is made to become the maximum, the obstacle on the coke oven 11 can be avoided and observation and repair of the coke oven 11 of the whole surface of the height direction of a flue wall can be performed with sufficient accuracy.

[0025]As mentioned above, although the embodiment of the invention was described, all of change of the conditions which this invention is not limited to the above-mentioned

gestalt, and do not deviate from a gist are scopes of this invention. For example, a magnet scale other than a chain, etc. can also be used as a rack. A distance measurement means, a tachometer, etc. using the laser beam generally used can also be used besides the encoder which measures descent distance.

[0026]

[Effect of the Invention]In the observation repairing device of the coke oven combustion chamber according to claim 1 to 4, Since the boarding ramp vehicle holding a lance is connected with the endless track attached to the guiding ascent and descent, Can observe and repair the wall surface of the sliding direction of the whole combustion chamber and a combustion chamber which avoided the obstacle on a coke oven easily and has been arranged to the longitudinal direction of a coke oven, and. Generating of black lead in a coke oven and the loss of the generating gas in a coke oven chamber can be controlled, and, as a result, extension of the life of a coke oven can be aimed at.

[0027]Especially in the observation repairing device of the coke oven combustion chamber according to claim 2, Since the measurable measuring instrument is formed for the rise-and-fall distance of the lance in the boarding ramp vehicle via the sprocket which fixes a rack to a guiding ascent and descent, and is geared and rolled on a rack, Even if elasticity by ambient temperature, a machining error, etc. arises in a guiding ascent and descent, the tip position of the lance inserted into the flue hole can be determined, and it is stabilized, and doubling of the image pickup position of the lance for observation and the position of the lance for repair can be carried out, therefore the accuracy of repair can be improved.

[0028]In the observation repairing device of the coke oven combustion chamber according to claim 3, since the encoder which contained the limit switch is used for a measuring instrument, it can grasp the reference point and migration length of a lance by low cost using easy composition.

[0029]In the observation repairing device of the coke oven combustion chamber according to claim 4, Since each of the wheel of the couple of the upper part provided in the boarding ramp vehicle and the bottom is pressed in the direction which is different into the slot of the frame of a guiding ascent and descent, Inclination of the lance at the time of a boarding ramp vehicle going up and down can be controlled, a lance can be correctly inserted in a flue hole, and, for this reason, breakage at the tip of a lance can be prevented.

[Translation done.]